

Avionics Subsystem

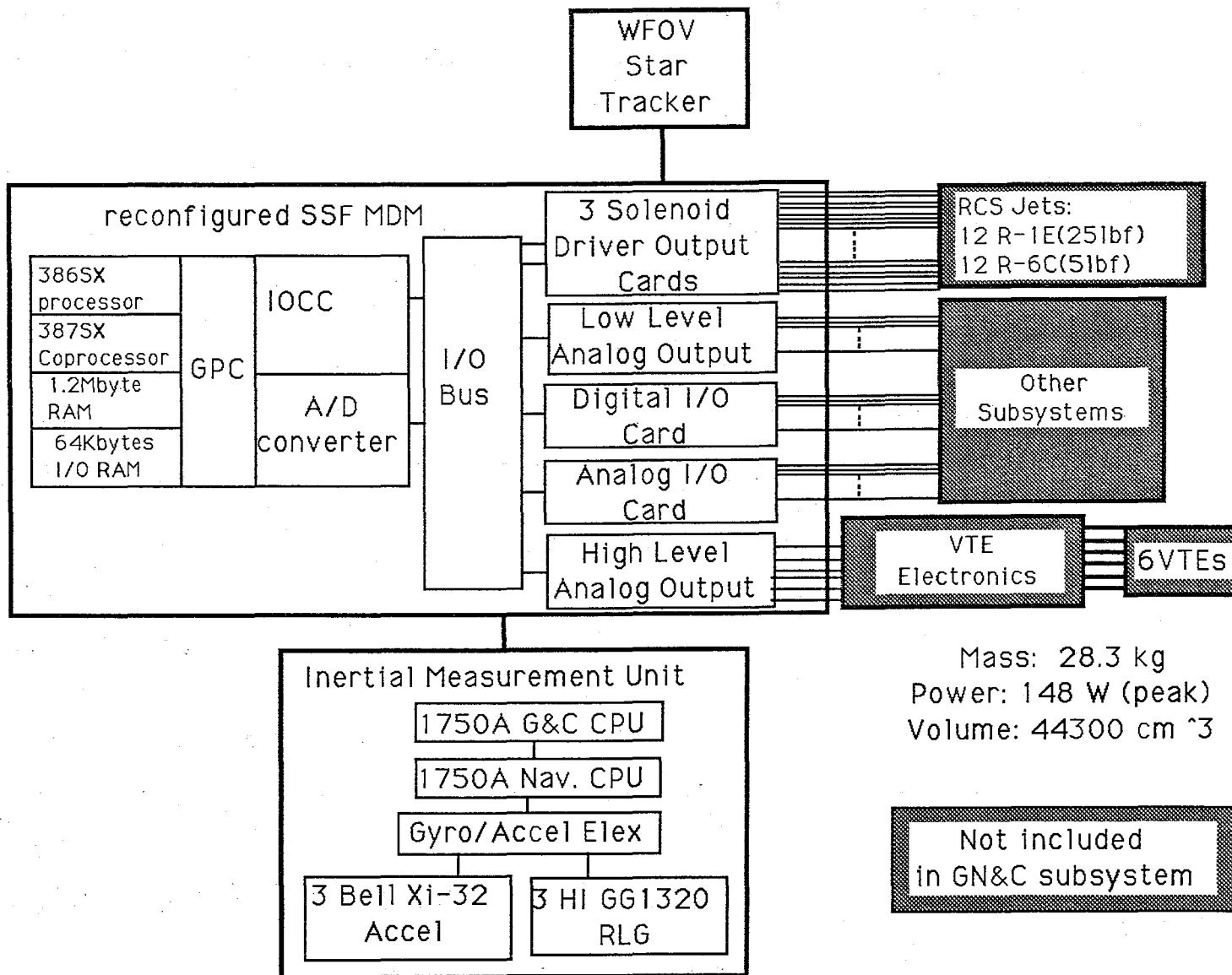
Subsystem Requirements:

- Guidance , navigation and control of the spacecraft
- Central computer for all subsystems
- Data storage for all subsystems for telemetry purposes

Avionics Subsystem

Unit	Cost \$	Mass kg	Vol. cm ³	Size cm	Power W	#	Description	Rqmts
IMU	275K/1 (TBD NRE : nav. algorithm)	7.3	7200	17.7x 17.7x 22.9	40	1	<ul style="list-style-type: none"> • Honeywell H-764 • available 92 • 3 RLGs, 3 accel. • 2 CPUs • MTBF > 4000 hrs • Contact: L. Brown (813) 539-5814 	<ul style="list-style-type: none"> • alignment every 12 hrs & prior to major burns
Star Tracker	500K/1 3M/10 (TBD NRE : quaternion algorithm & processor)	1	8100	18x 18x 25	8	1	<ul style="list-style-type: none"> • Lawrence Livermore • Space Cert. in 92 • available 1/93 • converts 28V to ± 5, ± 15 V • contact: I. Lewis (415)294-6531 	<ul style="list-style-type: none"> • access to stars • cold plate
GPC	inc.	inc.	inc.	inc.	inc.		• in MDM	n/a
Data Mem.	inc.	inc.	inc.	inc.	inc.		• in MDM	n/a
MDM	450K/1 (< 600K NRE: 28V power supply)	20	29000	37x 23x 34	50 (nom) 100 (peak)	1	<ul style="list-style-type: none"> • Honeywell Space Station MDM • available 2 Qtr 92 • interfaces for all subsystems • reconfigured by changing cards • programming, debugging & hardware integration testing with workstations • contact: L. Brown (813) 539-5814 	<ul style="list-style-type: none"> • access to all systems by cable • cold plate, passively cooled
RCS RJD	inc.	inc.	inc.	inc.	inc.	3	• Solenoid Driver output card in MDM	
Avionics	1.225M/1 10.25M/10	28.3	44300		98 nom 148 pk			

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Trade Studies Performed:

- IMU
- Star Tracker vs. Horizon Sensor & Sun Sensor
- RJDs vs Solenoid Driver Cards
- MDM vs GPC, Data Storage & Standard Bus

Programs Studied:

- ACRV
- AFE
- Apollo
- Lifesat
- MRSR
- OMV
- Shuttle
- Surveyor
- Viking

Companies & Agencies Contacted:

- Ball Aerospace
- Bell Lab
- Bendix
- Draper Lab
- Delco Systems
- Gulton
- Honeywell
- Kearfott G&N Corp.
- Litton G&N Systems
- Livermore Lab
- Lockheed
- Marquardt
- Martin Marietta
- Microcosm
- Motorola
- Northrop
- Optics Corp of Amer.
- Orbital Sciences Co.
- Radstone
- Rockwell Int.
- Teledyne Systems
- Textron
- TRW
- GSFC
- JPL
- LaRC
- MSFC

Discriminators Considered:

- Cost
- Schedule
- Performance
- Mass
- Power
- MTBF
- Certification
- Operating Temp.